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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/626,630

07/25/2003

David Keith Bowen

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BUCHANAN INGERSOLL PC
(INCLUDING BURNS, DOANE, SWECKER & MATHIS)
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EXAMINER

HO, ALLEN C

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 01/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/626,630

Applicant(s)

BOWEN ET AL.

Examiner

Allen C. Ho

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-11,13-16,19 and 23-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-11,13-16,19 and 23-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 16 is objected to because of the following informalities:

Line 5, "plates" should be replaced by --blades--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 5, 6, and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites "said device transmits at least 60% of incident high-energy radiation".

Claim 6 recites "the transmission efficiency is in the range of 60-80%". These recitations are indefinite because the transmission efficiency depends on the type of radiation source being used and the orientation of the radiation source with respect to the Soller slit device. For example, if the incoming radiations were highly collimated, then the transmission efficiency would likely be high. However, if the incoming radiations were emitted by a close divergent radiation source, then the transmission efficiency would be really poor.

Claim 19 recites "the high energy radiation collimating device comprises a Soller slit device." It is unclear whether the Soller slit device refers to the parallel blades set forth in claim 16 or it is in addition to the blades.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 5, 6, 10, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Tosswill *et al.* (U. S. Patent No. 4,125,776).

With regard to claim 1, Tosswill *et al.* disclosed a Soller slit device comprising: a plurality of substantially parallel blades (10) that are spaced apart from one another to form passages for the transmission of x-rays, the blades being constructed from glass sheets each having a thickness less than 250 μm (column 4, lines 40-43) and whose surfaces have a non-reflective treatment (14) to absorb divergent x-rays that are not substantially parallel to the blades.

With regard to claims 5 and 6, Tosswill *et al.* disclosed the Soller slit device of claim 1, wherein the device transmits 60-80% of incident high-energy radiation (when the incident high-energy radiation is highly collimated).

With regard to claim 10, Tosswill *et al.* disclosed the Soller slit device of claim 1, wherein the thickness of each blade is no greater than 70 μm ($t_s = 25 \mu\text{m}$, column 4, lines 40-43).

With regard to claim 13, Tosswill *et al.* disclosed the Soller slit device of claim 1, wherein the surface of each of the blades has a coating (14) that is non-reflective to x-rays.

With regard to claim 15, Tosswill *et al.* disclosed the Soller slit device of claim 1, wherein the surface of each of the blades is etched to prevent reflection (column 6, lines 25-35).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tosswill *et al.* (U. S. Patent No. 4,125,776) as applied to claim 1 above.

With regard to claims 7-9, Tosswill *et al.* disclosed the Soller slit device of claim 1. However, Tosswill *et al.* failed to disclose the length of the blade.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide blades having a length in the range of 12-15 cm, since a person would be motivated to provide a blade having a length that is commensurate with the application.

With regard to claim 11, Tosswill *et al.* disclosed the Soller slit device of claim 10. However, Tosswill *et al.* failed to teach that the thickness of each blade is approximately 50 μm .

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide blades having a thickness of approximately 50 μm , since a person

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would be motivated to provide a blade having a thickness that is commensurate with the application.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tosswill *et al.* (U. S. Patent No. 4,125,776) as applied to claim 13 above, and further in view of Moulton (U. S. Patent No. 6,494,618 B1).

With regard to claim 14, Tosswill *et al.* disclosed the Soller slit device of claim 13. However, Tosswill *et al.* failed to teach that each blade has a coating of barium sulfate.

Moulton disclosed that barium sulfate is an x-ray attenuating material (column 5, lines 48 - 50).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to coat the blades with barium sulfate, since a person would be motivated to use a material that has demonstrated usability as an x-ray absorbent material.

9. Claims 16, 23-28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tosswill *et al.* (U. S. Patent No. 4,125,776).

With regard to claim 16, Tosswill *et al.* disclosed a system comprising: a high-energy x-ray source (column 4, lines 27-28); a high-energy radiation collimating device comprising a plurality of substantially parallel blades (10) that are spaced apart from one another to form passages for the transmission of x-rays, the blades being constructed from glass sheets each having a thickness less than 250 μm (column 4, lines 40-43) and whose surfaces have a non-reflective treatment (14) to absorb divergent x-rays from the source that are not substantially parallel to the blades.

However, although Tosswill *et al.* disclosed this invention is for use in nuclear physics and nuclear medicine (column 1, lines 13-16), Tosswill *et al.* failed to disclose a device for collecting x-ray radiation after the x-ray radiation impinges on a sample to be examined.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a device for collecting x-ray radiation after the x-ray radiation impinges on a sample to be examined, since a person would be motivated to ascertain the property of the sample revealed by the interaction between the x-rays and the sample.

With regard to claims 23-25, Tosswill *et al.* disclosed the diffractometry system of claim 16. However, Tosswill *et al.* failed to disclose the length of the blade.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide blades having a length in the range of 12-15 cm, since a person would be motivated to provide a blade having a length that is commensurate with the application.

With regard to claim 26, Tosswill *et al.* disclosed the diffractometry system of claim 16, wherein the thickness of each blade is no greater than 70 μm ($t_s = 25 \mu\text{m}$, column 4, lines 40-43).

With regard to claim 27, Tosswill *et al.* disclosed the diffractometry system of claim 26. However, Tosswill *et al.* failed to teach that the thickness of each blade is approximately 50 μm .

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide blades having a thickness of approximately 50 μm , since a person would be motivated to provide a blade having a thickness that is commensurate with the application.

With regard to claim 28, Tosswill *et al.* disclosed the diffractometry system of claim 16, wherein the surface of each of the blades has a coating (14) that is non-reflective to x-rays.

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With regard to claim 30, Tosswill *et al.* disclosed the diffractometry system of claim 30, wherein the surface of each of the blades is etched to prevent reflection (column 6, lines 25-35).

10. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tosswill *et al.* (U. S. Patent No. 4,125,776) as applied to claim 28 above, and further in view of Moulton (U. S. Patent No. 6,494,618 B1).

With regard to claim 29, Tosswill *et al.* disclosed the diffractometry system of claim 28. However, Tosswill *et al.* failed to teach that each blade has a coating of barium sulfate.

Moulton disclosed that barium sulfate is an x-ray attenuating material (column 5, lines 48 - 50).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to coat the blades with barium sulfate, since a person would be motivated to use a material that has demonstrated usability as an x-ray absorbent material.

Response to Arguments

11. Applicant's arguments filed 29 December 2005 with respect to the rejection(s) of claim(s) 1, 5-11, 13-16, 19, 23-30 under 35 U.S.C. 102(b) or 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Tosswill *et al.* (U. S. Patent No. 4,125,776).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- (1) Kumakhov (U. S. Patent No. 6,678,352 B1) disclosed an anti-scattering x-ray grid.
- (2) Kogan (U. S. Patent No. 6,444,993 B1) disclosed a variable collimator.
- (3) Boxen (U. S. Patent No. 6,353,227 B1) disclosed a dynamic collimator.
- (4) Sokolov (U. S. Patent No. 5,970,118) disclosed a cellular x-ray grid.
- (5) Logan *et al.* (U. S. Patent No. 5,455,849) disclosed an air-core grid
- (6) Sokolov (U. S. Patent No. 5,389,473) disclosed a method of producing x-ray grids.
- (7) McGann *et al.* (U. S. Patent No. 5,263,075) disclosed a high angular resolution x-ray collimator.
- (8) Fahrig *et al.*, "Performance of glass fiber antiscatter devices at mammographic energies", Med. Phys. 21, 1277-1282 (1994).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink that reads "Allen C. Ho". The signature is written in a cursive, flowing style.

Allen C. Ho
Primary Examiner
Art Unit 2882

12 January 2006